
Information technology transfer to a developing country

IT transfer:
EISs in Turkey

Executive information systems in Turkey

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Researching executive information systems in a developing country

The main objective of the research described in this paper and conducted at the Department of Business Systems, University of Wollongong, New South Wales, was to investigate executive computing in Turkey. Computer applications which support low-volume, high-value transactions represent an increasingly significant component of business computing, in contrast to the high volume, low individual value transactions tackled by earlier generations of application (Sprague and McNurlin, 1993). Such applications are, by their own definition, more closely tailored to the requirements of the specific organizations they support. Their value is therefore more dependent on close adjustment to organizational cultures. Sproull and Kiesler (1991) suggest that such information systems will themselves produce both first- and second-order effects. Initial improvements in technical *efficiency* are succeeded over time by opportunities for greater organizational *effectiveness*. However, the transfer of such technologies between national cultures can be seen to present additional problems of learning and adaptation.

The study was limited to specialized executive information system (EIS) applications, excluding other computing activities by executives such as the use of more generic spreadsheets and word processors. As with other countries, many younger executives in Turkey use computers extensively for such tasks; like their colleagues, they learned to use such applications as they climbed their corporate ladders. However, not many of them are familiar with an EIS, an application which is "genuinely theirs". Indeed, although all organizations in the country over a certain size are fairly computerized, very few of them use such applications. Only nine Turkish organizations could be identified as full users of an EIS. Four of these organizations agreed to provide detailed information and several members were interviewed in conjunction with this research. Since the application of this technology is in its infancy in Turkey and there is only an extremely limited number of examples available, qualitative research methodologies were used.

Semi-structured interviews were employed as the main data collection method. Additionally, relevant internal documents and software within the

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organizations were observed. Once the organization was located, a connection in the company was sought. The “connection” was anyone from the staff, the higher in rank the better. Friends of friends and relatives were instrumental in establishing the initial contacts. This is an effective method of conducting research in a culture where such personal requests are difficult to decline. Two companies became involved in the research in this way. The author had already developed contacts with the other two through involvement in IS projects on a consultancy basis. The interviews were held with EIS users and IS support personnel. A voice recorder was used during the interviews, with the consent of the interviewees.

The interviews were started with a brief description of the research conducted and continued with general questions about the organization and the EIS. In the second part, more specific questions about the system were asked with an *aide-mémoire* providing an interview “template” (see the Appendix). Besides allowing the researcher to maintain a consistent approach to the organizations, this method also proved to be useful in “making the interviewees talk”. The interviewees were told that what they had to say was more important than the questions posed and they were encouraged to express their own perceptions and ideas throughout the process. This often led to the capture of rich data and the observation of causal relationships which would not be obtained from either strict structured interviews or postal questionnaires. The interviews concluded with the inspection of documents (if any) and the EIS software.

Problems and prospects for IT in less-developed countries

Information technology has been one of the fastest growing industrial sectors in developed countries in the last four decades. Through declining hardware costs and increasing benefits, IT has achieved varying intensities of diffusion to less-developed countries (LDCs). Like developed countries, many LDCs have joined the race to become “information rich” (Sackman, 1981). Being aware that computers are the most important factor in this process, some countries have developed or adopted robust information policies to realize their goals. However, as latecomers to the IT scene, they face enormous difficulties, perhaps the most important being that they are becoming users of IT without the required infrastructure and manpower to support it. The gap between the information rich and the information poor is widening over time and there is not much indication in the foreseeable future of any opposite trend.

However, the future may not be entirely bleak for the LDCs. They have certain advantages in becoming information rich which stem from some of their common characteristics and their status as latecomers. Some of them, like Taiwan and India, have created a comparatively robust IT industry and are currently enjoying the benefits of competing in specific segments of the world's IT markets (Nidumolu and Goodman, 1993, pp. 15-22). Research and development efforts in information technologies have been concentrated in a few developed countries. In these countries, a handful of key computer companies control an overwhelming proportion of the world's IT resources. Although they

serve about three-quarters of the world's population, the specific conditions of IT in the LDCs are not subject to extensive research. Instead, there is a tendency to adopt results from developed countries. Efforts based on such assumptions cannot be meaningful if they do not take account of local technological and cultural constraints.

A United Nations study recognized the existence of four levels of computer usage in developing countries (Paker, 1981, p. 178; Perelet, 1977, p. 6). These levels are identified as initial, basic, operational and advanced. They are measured in terms of a computer industry development potential (CIDP). Much has changed since that study was conducted. Such a classification can give only a superficial idea of relative levels of computer usage in the LDCs during the 1970s. However, it is striking to note the starting level of countries which have made significant progress since that time. For example, Singapore was ranked alongside Turkey and Panama just two decades ago.

More recently Palvia *et al.* (1992, p. 25) have made a rough classification of LDCs according to their level of IS usage. They suggest that the UN's *basic* level classification described above corresponds to the underdeveloped nations and the *operational* level corresponds to the developing nations. These authors claim that the major problems confronting underdeveloped countries reflect infrastructural needs (e.g. a reliable power supply) and that key issues for developing countries reflect operational needs (e.g. developing reliable software).

Cultural differences

Computers are products of the Western world. They have been designed to work in a particular cultural environment. This environment does not exist in all parts of the world. One of the most important problems of the LDCs in fostering IT is their cultural difference from Western societies where individualism and rationalism are accepted as the higher values of life. That may not be always the case in the LDCs, particularly from the point of view of individualism. Consider an example:

Adaptation of the Burroughs computer system by the State Bank of India, along with the packaged banking software ... has not been found very suitable and because banking practice in India is being organized on a "social responsibility" ethos quite different from the American philosophy, the package has remained largely unutilized (Banerjee, 1981, p. 101).

Indeed, almost all computer applications have been designed to work in a particular cultural environment. The notable exception among developed countries is Japan, where an Eastern culture has been successful in creating an impressive computer industry and information technologies. However, Japan and some South-east Asian countries are exceptions and the general rule is a one-way traffic of IT transfer between the West and the East. The Western mind-set is so dominant in this area that the software designed and produced in the LDCs generally reflects Western thought. The LDCs face the challenge of either adopting this mind-set or creating their own alternatives in IT applications.

There might be several motivations for introducing IT into organizations. Perhaps the most common motivations are “cost displacement” and “value adding” (Davis, 1992, p. 384). Cost displacement is realized by substituting technology for people and added value is realized by rationalizing work practices with the support of the technology. It is generally argued that the first motivation is predominant in developed countries and the second one should be predominant in the LDCs.

Personal contact may be the dominant mode of communication in some cultures (Yavas *et al.*, 1992, p. 76). It may be so overwhelming that communication via IT and computers may face strong resistance. In these cultures, information is implicit in the physical context or is internalized within the people involved. Resistance may stem from a widespread perception that computers degrade personal communications.

There has been widespread discussion of whether computers replace jobs in organizations. Convincing examples are given for and against in this discussion (Armstrong, 1988, pp. 145-7; Chepaitis, 1992, p. 107; Price, 1988, p. 251). It could be argued that the more effective IT is in the organization, the more likely that some jobs will disappear. In developed countries, technology is often a cheaper alternative to personnel. The opposite holds in developing countries and the generally lower wages may have a retarding effect on IT investment in the LDCs. Although this is clearly a problem for proponents of IT, it is arguable whether it is a “problem” in the bigger picture. The LDCs have generally high levels of direct and indirect unemployment and might not have effective social security systems to support job losses. Although support from family ties may be stronger than in developed countries, unemployment can be socially and personally more destructive in the LDCs.

In the LDCs there is a general tendency to underestimate the managerial and organizational perspectives of IT. Technical aspects like programming are emphasized at the cost of the managerial aspects. This was also the case in the initial stages of IT deployment in developed countries. Sproull and Kiesler (1991) imply that comprehending the managerial aspects of IT requires a degree of sophistication that develops over time and through experience. The adoption of IT is closely associated with organizational change but the emergence of more *rational* work practices and the development of the organizational discipline required by IT are directly related to the managerial aspects of organizations rather than the technical aspects. Kaplinsky (1994) shows that with manufacturing in Asian, Latin American and sub-Saharan African countries, the diffusion of Japanese managerial techniques has achieved significant improvements in performance without resort to capital intensive equipment, including information technologies. Kaplinsky concedes that the further gains necessary to survive direct competition with developed countries will require comparable levels of investment, but he demonstrates that the necessary reorganization is not dependent on the immediate availability of Western hardware.

One of the most important problems of the LDCs is the inadequacy of trained personnel, both qualitatively and quantitatively. This prerequisite is becoming more important over time because of the ever-increasing sophistication of IT. Unlike developed countries where hardware and software support is taken for granted, management information systems (MIS) managers in the LDCs have to think twice where support is concerned. Lack of qualified support personnel and problems in obtaining hard currency may prove to be major obstacles for developing and maintaining effective computerized information systems. Training-on-the-job facilities are also generally far from satisfactory, not least because the effectiveness of the training organizations is questionable. Additionally, they require scarce resources which may be directed to other priorities.

English is the international language for information technologies as well as for global trade. Programming languages and most of the hardware and software manuals require some knowledge of English. It is also the prerequisite for training people in IT. Although many LDCs have elite universities in which the medium of instruction is English, this poses a dilemma because the graduates of these universities are even more prone to the brain drain than others. High income, better living standards and possibly a more free political and social environment in developed countries might be too attractive for high calibre IT people. A non-roman alphabet or character set would create another problem, since computers use the roman as the "native" alphabet and additional cost and effort is necessary to support a national character set that differs from this.

In most of the LDCs, university curricula are generally computer science-oriented rather than IS-oriented. Information systems has not emerged as a separate discipline in many of them. While a comparable situation has been noted in the West (e.g. Buckingham and Land, 1987), it has also been argued that computer science education alone is inadequate for arming the students with the necessary managerial and administrative skills for developing complex, organizationally sensitive computer applications, such as EISs (Little and Margetson, 1989).

Many LDCs lack the necessary legal infrastructure for their IT sector. Even if appropriate legislation exists, there can be no guarantee that it will be exercised effectively. Software companies are extremely sensitive to the illegal copying of their products. In some LDCs illegal software copying is not seen as unethical, rather it is seen as a response to information imperialism. The overhead of this illegal copying may be unacceptably high for some Western software companies and, unlike the hardware companies, they are usually reluctant to invest in the LDCs creating a further hindrance to the transfer of IT to the LDCs (World Bank, 1993, pp. 83, 181).

Turkey: background information

Turkey is located in Asia Minor and has always been a gateway between the East and the West. It has a population of more than 60 million of which 99 per

cent are Muslim. The Turkish Republic was founded in 1923 after the collapse of the Ottoman Empire and the national objective of "achieving contemporary (i.e. Western) civilization" has been adopted since that time. Although currently this objective is more questioned than ever, it has always been the pillar of the republic.

Turkey is integrating into the world economy; it is a member of NATO and OECD and its application for membership of the EU customs union which was approved by the European Parliament in December 1995 represents an important milestone. Despite significant opposition both to the customs union and the EU in the country, the government is enthusiastic to attract foreign capital. Several multinationals have responded positively, taking advantage of the country's geographical and economic proximity to European markets. In the automotive industry, for example, Toyota started production in its Turkish plant in 1994; and Hyundai started to construct its plant in 1995; Mazda, Honda and Daewoo have received official permission to establish theirs. They will join Ford, Fiat, Opel and Renault which have produced cars and large vehicles in the country for several years. The new entrants, which establish joint ventures with the existing local industrial groups, have an apparent strategy of accessing the European markets through the new customs union agreement as well as entering the less mature local market.

This situation exists in several other industries. The process of becoming a world class manufacturing and consumption base requires the adoption of contemporary managerial practices, supported by information and communication technologies. Hence, Turkish managers must develop appropriate ways to access the benefits of state-of-the-art technologies, including EISs. However, this is not an easy task because this is a sociocultural rather than a technical process which involves mastering tools and techniques developed in alien cultural settings.

A large majority of Turkish organizations have established close contacts with organizations from foreign countries and, hence, differences once associated with interorganizational interactions have become implicit in intraorganizational activities (see Kaye and Little, this issue of *ITP*, for further discussion). For example, Sabanci, the second largest industrial group in the country, has established a joint venture with Toyota Motors Corporation after decades of importing and marketing Toyota cars. Named ToyotaSa, this joint venture is managed by Turkish executives and it employs both Turkish and Japanese staff in its production plant. Many employees from both parties who previously communicated over large distances now occupy adjacent desks in the new organization. O'Hara-Devereaux and Josephson (1994) argue that the globalization of economic activity is increasingly requiring organizations and individuals to span barriers of space and culture. The dominance of Western models of business processes ensures that, in the area of information systems, a new form of cultural imperialism requires participants from non-Western settings to take on board procedures and structures developed without their involvement. At the same time, as globalized and networked business

arrangements become increasingly dependent on information and communication technology, the need to achieve a culturally robust environment such as the “third culture workspace” described by O’Hara-Devereaux and Josephson, (1994, pp. 224-44) becomes critical.

On achieving independence, most of the Turkic republics of the former Soviet Union took Turkey as a role model in their quest to become Western-oriented nations. This is understandable, because they share language, ethnic origin and religion with Turkey. Aware of this fact, many Western multinationals have attempted to use their Turkish branches to access these untapped markets. For example, one of the case-study companies described below (Company D) established a branch for the former Turkic Soviet republics as well as Armenia and Georgia. The executives in this new branch were appointed from the cadres of the Istanbul branch of this large European multinational. It is apparent that the headquarters of Company D is well aware of the opportunities stemming from its culturally diverse nature. From Turkey’s point of view, this is yet another opportunity both to foster her image as a Western-oriented role model and to develop considerable export transactions.

By mid-1992, Turkey had become the fourth largest aid donor to this region, after the EU, USA and Japan. Economic aid has reached US\$2.5 billion and 10,000 scholarships and extensive food aid were also provided (Strang and Redmond, 1991, p. 23). However, in the last few years Turkey has not been without competitors for her traditional role in central Asia as a bridge between East and West. Although each has a different agenda, Iran, Saudi Arabia and Russia are all keen to develop intimate relationships with the central Asian republics. Common ethnic origin, language and religion may not mean much against today’s harsh realities, so Turkey has to use its tangible comparative advantages to become the stepping stone to Central Asia. Comparatively modern management practices supported by IT are essential in this process.

As a developing country, Turkey offers an opportunity to assess the implications of the development and use of advanced computer applications at some remove from their origins. It provides a context lacking the infrastructure of physical resources and experience available to organizations in the predominantly developed countries which initiated the development of EIS applications. Ohmae (1993, p. 87) asserts that countries which have a gross domestic product (GDP) in the range of US\$1,000-3,000 *per capita* are in the “take-off” range of the “development queue”. Unlike Japan which had only a few competitors when it was in this range after the Second World War, there are several such countries in the 1990s. With about US\$3,000 GDP, Turkey is one of them. Today there is fierce competition for markets not only between companies but also between the nations in which rival companies are based (Porter, 1990). In the current conditions of an integrating world economy, competing LDCs share many common economic and social problems as well as opportunities. Despite its particularities, Turkish experience is relevant to a number of comparable developing countries.

Turkey and the "information society"

According to a working group report by some leading figures in IT from academia and industry (IIKBSCG, 1992, pp. 38-46), Turkey requires a comprehensive information policy to transform to an "information society" (Bell, 1974). The report argues that there are three main steps to become such a society:

- (1) Industrialized economy in transition;
- (2) Limited information economy;
- (3) Information-based economy.

According to the report, Turkey is at the first step of this process. General characteristics of nations at this step are:

- Information demand is concentrated in the sectors of banking, international trade, government's tax and insurance administration.
- Although there are some investments in IT and communications, inadequacy of trained personnel and problems in developing software limit the benefits.
- There is little or no legal infrastructure for protection of software.
- Development of the private sector in IT is slow.
- The general education system is inefficient.

The report argues that Turkey must aim to move on to the second step within the next ten years.

IT in Turkey

The quality and extent of IT applications vary widely in Turkey. Local subsidiaries of foreign companies generally have more advanced applications than local organizations. The reasons for this are manifold. They can attract and retain better personnel by offering higher salaries, their training facilities are better and they usually have the global IT strategy of the parent corporation readily available. The other end of the continuum is represented by public sector offices. They have low salaries, inadequate training facilities and a rigid bureaucracy for which rationalization of operations is not the primary target.

By measures such as GDP per capita, export/import ratios, private consumption levels and inflation, Turkey is a developing country. Since the mid-1980s all Turkish governments have pursued a policy of economic liberalization. Although this policy has resulted in a substantial increase of exports, imports have increased even more. Consequently, the foreign trade deficit and external debt have increased dramatically. External debt reached US\$60 billion by the end of 1993 (OECD, 1994, p. 125).

However, opening up to foreign markets gave Turkey an opportunity to expand and refine its IT infrastructure during the late 1980s and early 1990s. IT in the country benefited considerably from the liberalization of imports during

that time. Improvements in the telecommunications infrastructure were particularly explosive during the 1980s. Nevertheless, the country is still far behind the developed countries in both hardware and software markets. Table I compares Turkey with some other countries on a number of key IT indicators.

	USA	Japan	Mexico	Korea	Turkey (1985)	Turkey (1990)
IT investment per capita (US\$)	400	400	14	45	3	12
Software as percentage of IT	42	35	36	24	7	13
PCs as a percentage of total computers	45	30	55	40	17	44
Hardware exports (US\$ billions)	21	17	0.5	3.5	0	0.02
Computer student/ million population	1,000	830	230	1,100	130	160
R&D as a percentage of GDP	2.9	2.9	0.4	1.8	0.1	0.2

Source: World Bank 1993, p. 15

Table I.
Cross-country
IT indicators

Computer usage is already fairly common both in private and in public institutions. According to one IT research institution report (Interpro, 1993a, p. 34) "everyone including executives" in 81.6 per cent of private and 52.9 per cent of public organizations use computers. Since EIS and decision support system (DSS) applications are not common in the country, this report suggests that some of the executives use computers for personal productivity tools such as spreadsheets.

Almost all established universities in the country have computer engineering or computer science departments. However, IS has not yet emerged as a separate discipline in these universities. This resembles the situation in India as reported by Palvia *et al.* (1992, p. 13). Undergraduate programmes are four years and in some of the universities the medium of instruction is English.

There are more than 20 IT periodicals published in the country covering a broad range of issues. Most of them have a particular area of specialization such as Macintosh software. However, almost all of them are practically oriented rather than research oriented. Only *Bilisim*, which is published by the Turkish Informatics Society, occasionally publishes academically oriented research papers. Major daily newspapers also publish computer pages once a week.

Connection to the Internet was first established by the Middle East Technical University in April 1993. The connecting node is the National Science Foundation in the USA. A second connection was established in the beginning of 1994 by Ege University to EBONE in Germany. Both lines were initially 64 kbits per second. With increasing Internet usage, the USA line was upgraded to 128

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kbits per second in November 1995. A further upgrade to 256 kbits per second was planned for the beginning of 1996. Currently almost all universities and some public offices use these lines for accessing the Internet, the country has the thirty-first highest level of Internet traffic in the world (Onalan, 1994, p. 12). A major project is also under way to provide Internet connection to some former Soviet republics via Turkey.

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Turkey made massive investments in its telecommunications infrastructure in the 1980s. In the second half of the decade, telecommunications expenditure was about 1 per cent of GDP per annum. More than half of the network became digital and currently almost all hardware requirements are produced domestically. During this time the network size was being tripled to cover all parts of the country with high quality telephone lines. These achievements were accomplished by PTT, the publicly owned telecommunications company of Turkey. The investments were financed from their internal telecom revenues instead of with foreign credits.

Almost all major international hardware vendors operate in Turkey. For example, IBM started its operations in the country in 1935. Their contribution to the IT sector through the training of staff is significant. The first digital computer was installed in Turkey in 1960 by the State Directorate of Highways. By 1980, there were 300 data processing centres in the country and number of items of data processing equipment increased sharply during the 1980s. This trend was accompanied by the fast spread of personal computing throughout the world in the early 1980s.

The most computerized sector in Turkey is the banking sector. This could perhaps be explained by the fierce competition in the sector. When the first automatic teller machine (ATM) was installed in 1987 by Is Bankasi, almost all major banks had to install theirs shortly afterwards. By January 1994, there were 3,681 ATMs in Turkey with a total value of US\$147 million (Kazdagli, 1994, pp. 18-19). According to one market research report (Interpro, 1993a, pp. 10-11), the total value of the installed hardware in the largest 100 organizations in Turkey is US\$963 million; \$890 million of that value is from non-PC hardware and the remaining \$73 million represents the total value of PCs.

There is a small but vibrant PC market in the country with 150,000 units sold in 1994. The total number of companies active in this area is 62 (Uluirmak, 1993, p. 94). They sell 613 models from 78 companies. Slightly less than 30 per cent of the machines are assembled in Turkey, but slightly more are imported directly from Asia, with the USA and Europe contributing half as many each (Uluirmak, 1993, p. 94). One of the PC assemblers is establishing a manufacturing plant for motherboards and other units to start production in 1996.

While the global software market experienced strong growth of about 20 per cent per annum in the 1980s, Turkey's software industry has experienced a remarkable growth of 70 per cent per annum since 1985. Although this growth is phenomenal, currently the market, valued at US\$76 million for 1993, represents only 0.05 per cent of the global software market which totals US\$150 billion. By comparison, Turkey's gross domestic product is 0.4 per cent of the global GDP

(World Bank, 1993, p. 57). This suggests that the Turkish software market is far from representative of the level of economic activity in the country.

A few decades ago, software was a small part (10-20 per cent according to many) of the total IT expenditure. Currently software accounts for almost half of total IT expenditure in the developed countries (see Table I). While sharply falling hardware costs contribute to this trend, it can be argued that the ratio of the software expenditure is increasing along with the increasing sophistication of IT applications. The increase in Turkey's figure from 7 per cent in 1985 to 13 per cent in 1990 as well as figures from other countries support this argument.

Unlike hardware vendors, however, large international software companies are not very enthusiastic about operating in Turkey. An important reason for this is rampant software piracy. The Business Software Alliance (cited in World Bank, 1993, p. 180), estimates the ratio of illegally copied software at 40 per cent in the USA, 60 per cent in Germany, 80 per cent in Italy and 90 per cent in Turkey. According to Interpro's research (Interpro, 1993b, p. 84), 30,056 units of imported software for PCs (excluding operating systems) were sold in the country in 1992, compared with 97,000 PCs sold in the same year. This discrepancy may be attributable to illegal copying.

In spite of this, not all large software companies keep away. The notable exception is Microsoft which started a subsidiary in Istanbul in 1993. Other software companies generally prefer to work with independent Turkish companies who provide sales and support for their products. All major software companies have such dealer connections (sometimes more than one) in the country. DSS and EIS suppliers are also included in this list. Pilot Software and Comshare conducted surveys in Turkey to establish a dealership connection in 1990. These attempts were unsuccessful for two reasons: local enterprises found these systems too fancy for the current state of their IT operations; and the two companies themselves decided that the market was not ripe for their products. Nevertheless, in 1992, Information Resources concluded a dealership agreement with a local computer company.

There are several sources of software used in Turkey. The first is independent Turkish software companies. Almost all basic business packages are the familiar ones such as Excel or Oracle. These companies have concentrated on country-specific applications like accounting, inventory control, invoicing, etc. These are designed in compliance with Turkish laws and work practice. Three software companies (Link, Logo and ETA) have established markets for mass-selling software with a large selection of modules. The majority of software sales comes from the second source, hardware vendors selling both operating systems and application software. The third source is the in-house MIS departments of certain large industrial groups which have been organized as separate entities to develop software for the market.

Turkey's comparative advantages in IT

Some of the difficulties facing LDCs outlined above are problems in Turkey. However, the country has certain advantages for creating a robust IT sector and

transforming its economy into an information-based economy. Some of the following six advantages are common to other LDCs while some are specific to Turkish conditions:

- (1) As a latecomer to the IT scene, Turkey has not invested heavily in older computer technology. It does not have an extensive obsolete computer park which is expensive to maintain and run. Implementing the new technologies, IT departments in the country have the advantage of developing more reliable software in a shorter time on more reliable hardware platforms. Being able to bypass older mainframe architecture and make a short cut into the networks of small but powerful computers presents a real advantage. This is essentially what many IT departments in the developed countries have been trying to achieve through downsizing, the buzz-word of the last few years.
- (2) Customs duty for computers was abolished in 1987. Although some levies still apply, buying a computer in the country is now cheaper than before. Almost all major international computer vendors operate in the country and the computer market is highly competitive and advantageous for the buyer.
- (3) Turkey invested massively in its communications infrastructure in the 1980s. This successful project became one of the pillars of a potential information-based economy where dissemination of information is of prime importance.
- (4) Like most developing countries, Turkey has a large young population. Although the basic education system has certain deficiencies, the young population has the potential of becoming the key resource of a robust IT sector.
- (5) As a latecomer the country has enjoyed the benefit of sharply declining hardware costs during the last two decades.
- (6) IT salaries in the country are well below those in developed countries. This potential could be exploited for undertaking major software projects from the outside world. India has been particularly successful in using this advantage by the method of "body shopping" (providing on-site programming services to foreign clients) and "offshoring" (where software is developed in India) (Munasinghe, 1989, p. 23; Nidumolu and Goodman, 1993, p. 20). Recently, major Turkish software houses have combined their efforts to start a company for exporting software. However, they are aware of the financial difficulties of such a project as well as the tough competition from the former eastern bloc countries which have better-educated IT personnel.

Case studies of EIS adopters

Four organizations identified as users of EISs were willing to provide access for case-study purposes and these shared a number of characteristics. A large

majority of Turkish organizations which have implemented EISs are the local subsidiaries of multinationals. This pioneering role is not surprising, because:

- they usually follow their parent companies' global IT strategies which often incorporate EISs;
- their personnel are well trained about the importance of IT and they are aware of the advanced IT applications in the other subsidiaries and headquarters;
- they can get the required support from their sister organizations or headquarters;
- their financial strength enables them to attract and retain better personnel; and
- they usually have the necessary managerial and technical infrastructure required by the EIS.

Hence, it could be argued that the local subsidiaries of the multinationals play a critical role in transferring the new and advanced IT applications and practices to the country. This is true not only for EISs, but also for the other systems as well. There are several ways for this diffusion process to be realized:

- they train their personnel well and IT personnel change their jobs frequently;
- they create a demand for the new systems which is immediately supplied by the local software companies;
- most of the IT applications and practices can be imitated easily.

All of the organizations researched operate in the consumer packaged goods (CPG) industry. This is a data-rich industry where the competition is usually fierce. Product and company image is very important in the industry and extensive promotions and commercials are required for building and sustaining image. Sales data are particularly important for the CPG companies, because they are used as a feedback for measuring the effectiveness of the promotions and commercials which are continuously carried out. Executives in this industry usually have acquired solid sales data analysis capabilities as they climb the corporate ladder. It is not surprising that all of the EIS-implementers are CPG companies. Sales information is the most important (in some of them the only) component of their EISs. The CPG industry is sensitive to consumer needs and it is relatively independent from government interventions in the country. Hence, unlike some other industries where the government has ultimate power, competition for market share is usually fierce in this industry. Such an environment is conducive to the executive use of IT.

The EIS-implementing companies are medium to large by Turkish standards. Unlike early, expensive EIS packages, current software is within the purchasing power of medium and small organizations. Indeed, many such organizations spend much more than an EIS price tag for other software. The pioneering role

played by the early EIS implementers in the country seems to be a function of their multinational nature rather than their financial power.

Company A

Company A is a Turkish-American joint venture operating in the CPG industry. It was founded in 1986 and a majority of the shares is held by the foreign partner which is a large US-based multinational. The headquarters is in Istanbul and there are two manufacturing plants and several branches throughout the country. The company employs over 600 people. All personnel except two executives are of Turkish origin. The general manager and one other executive are non-Turkish and they represent the foreign partner in the joint venture. The general manager has mainly a controller role in Company A, because he also holds the post of general manager of some other companies owned by the foreign partner in Turkey and overseas. Since he is out of the company most of the time, daily activities of Company A are managed by the Turkish deputy general manager who acts as an operational general manager. The other non-Turkish executive holds the position of financial controller.

Company A has successfully implemented a standard MRP (material requirements planning) package named MFG-PRO, developed in Progress, a fourth generation language. Although principally a manufacturing package, this also contains finance and sales modules. Company A has started EIS implementation with these two modules. Personnel frequently stated that they are a sales- and marketing-oriented company and this must have been the reason why they have implemented financial and sales modules before manufacturing in an MRP package. Excluding personal productivity tools, MFG-PRO is the only central computer application in Company A and almost all transaction processing activities of the organization are performed by this system.

The EIS started as a low profile project for reporting sales and sales-related financial information, developed with internal resources in the Progress language. Being the "native" language of MFG-PRO, Progress has the natural advantage of conveniently accessing and processing MFG-PRO files. Consequently, Company A's EIS is mainly a front-end reporting tool with limited analysis capabilities. However, it is regarded as a successful system mainly because it presents the right information required by executives in an accurate and timely manner. The system is truly a *live* one and has been continually under further development since its introduction at the beginning of 1994. Studies for a new version with much wider information reporting and analysis capabilities are planned. Besides other technical features, the new version will have more advanced graphic capabilities. The benefits of the EIS are obvious in Company A, and there is a common belief that it should have a wider user base than the existing one. Unaware of current trends in worldwide EIS practices, the company has concluded that it is beneficial and should be further developed to become "everyone's information system".

Company B

Company B operates in the snack-food industry and is totally owned by a large multinational company. It was founded in 1985 by a Turkish food company which initially owned 100 per cent of shares. Three years later 50 per cent of these shares were sold to the current owner and in 1991 the remaining 50 per cent followed. The headquarters and manufacturing plant is in Istanbul. The company has contracts with several local distributors throughout the country and these have exclusive selling rights in their regions. It employs about 380 people and an additional salesforce of 450 people are employed by distributors.

Company B has a LAN with more than 70 PCs. There are also several notebook computers which can be connected to the LAN on demand. Logo is used for transaction processing systems. General ledger, invoicing, sales analysis, inventory control and fixed assets are some of the modules that are used by the organization. Although there is no facility to make upgrades to programs (program source code is not sold), Company B is generally satisfied with the product.

Distributors are asked to enter their sales data into standard databases which are specially designed for this purpose. These are Paradox databases and Paradox 4GL is used as the software for this process. These files contain data about the customers of distributors and are sent to headquarters via dial-up telephone lines once a week.

The general manager, who used EIS and DSS applications extensively in his previous posts, initiated procedures to implement a business information system in 1993. He wanted the system to be sales-oriented with extensive reporting and analysis capabilities. Although he was aware that what he wanted was a classical EIS package, he did not want to spend organizational time and effort to develop a system from scratch. Since he wanted only sales applications, he chose to implement a sales-oriented DSS with the intention of using it as an EIS. This seemed to be a logical solution to him, because he was aware that in the last few years EIS and DSS applications have developed rapidly so that many aspects of the two concepts now overlap. Hence, he decided to implement a DSS package Sales Management System (SMS), from Information Resources (IR). He contacted IR's local distributor and the project started at the beginning of 1994. Since Company B was the first organization to implement SMS in Turkey, the general manager wanted an experienced consultant from overseas to ensure the success of the project. The implementation process was fairly smooth and the system became fully operational in the middle of 1994.

Although SMS is a sales-oriented decision support system, it contains almost all the characteristics of a standard EIS package and the main reason for its preference over such a package was to avoid additional development effort.

Company B calls the system the business information system (BIS) and it is regarded as successful. Initially four user licences were bought for the general manager, sales director, marketing director and a middle manager from the sales department. Later, six additional user licences were bought to make some other executives, middle managers and sales staff users of the system. However, the

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system was never expected to be critical to the successful management of the organization. It is seen only as a successfully implemented support tool which provided concrete benefits in certain operations.

Company C

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Company C is the local liaison office of a large multinational company which operates in the soft drinks industry. The company has a policy of franchising its products to local bottlers all over the world and it has a medium-size franchise in Turkey, employing about 500 people. Company C employs 18 people and performs the task of being a liaison office between the multinational and the local franchising company. It also supports some marketing activities for the franchise. All its employees except the general manager are of Turkish origin. It has three divisions, namely marketing, finance and technical.

Company C has a Novell LAN with 15 PCs attached. Some staff also have notebooks which can be attached to the network when required. This means that almost everyone in the company has access to a computer. The server of the LAN is a Pentium machine and all other PCs including notebooks are 80486 based. There are several applications running on the network. Some of them are off-the-shelf programmes like spreadsheets and word processors while some have been developed overseas by the central IS department of the multinational. The finance department uses the financial modules of Logo. The parent company has a policy of using Microsoft products where possible and all off-the-shelf programmes are from this vendor. The hardware and software policies of liaison offices are strictly determined by the parent company.

Owing to its size, Company C does not have an IS department and some applications like general ledger and marketing have been developed in the USA for the use of liaison offices all over the world. The marketing application is fairly complicated and its main objective is to improve the effectiveness of the franchising company against competitors. As reported by Porter (1985, p. 123), this is an important concern for companies operating in the soft drinks industry.

Having standard applications in most branches provides a significant advantage in reporting and data communications between the headquarters and the branches. Since interfaces are common and file formats are the same, exchanging information is extremely easy in most cases. There is a leased data communications line between the office and the headquarters in the USA. This line can also be used for communicating with all other liaison offices in the world. There is also an extensive diskette traffic between several units of the company. The parent company has a policy of developing a competitive environment between its units. In Company C's case, this manifests itself as the competition with other countries' liaison offices. Success in this competition is measured in terms of sales and brand share. Since there are considerable differences in the total sales figures for each competitor, variance of sales compared with previous periods is used as a more meaningful criterion. The headquarters launched a project to automate the comparison process at the end of 1992. This project

involved distributing sales and market share data to the executives of liaison offices all over the world in a common format. An EIS package, namely Lightship from Pilot Software, is used as the front-end tool to save executives going through the unnecessary and unfriendly learning process often required by other reporting systems.

The parent company has an advanced EIS (developed by Lightship) in its UK office and many of Company C's employees have direct contact with that office. That system accesses the bottling companies' computers for operational data and enables its users to perform advanced sales and financial analyses on those data. In contrast, people in Company C tend to perceive their own EIS only as a simple reporting tool with limited capabilities. Furthermore, it is not regarded as a successful system; the number of users has fallen from six to three since initial installation. The general manager, finance director and product manager are the current users and they are reported to be using the system less frequently than before. It is to be replaced by a more sophisticated system under development in Hungary. This new system will cover sales, market share, and a broad range of issues in marketing and operations. It is being developed in a truly international environment with ideas and feedback from several branches including Turkey. No vendor EIS software is used in developing the system; instead, SQL Server and Progress are used for database and interface.

Company D

Company D is the local subsidiary of a large European multinational operating in the CPG industry. Its main line of business is foods such as margarine, cooking oil, tea and soup. It also has a sister company in the country operating in the business of cleaning and personal care products. With annual sales exceeding US\$350 million, Company D is regarded as a fine and established organization operating in Turkey for 40 years. Its market share is over 50 per cent for several of its products. It has six legal entities and in most of these entities 100 per cent of shares are owned by the parent company. In others some shares are owned by local companies.

Company D employs over 1,000 people, mainly of Turkish origin. The company has three production plants and several branches all over the country. Its headquarters is in Istanbul. The company has a long history of IS and used to be a predominantly IBM site. Several AS/400s are running locally developed applications in the headquarters, plants and branches. They communicate with one another through leased lines. In the last few years, increasing workload created a significant pressure on these machines and most of them are running close to the limits of their CPU and storage capacities. This results in unsatisfactory response times, a common complaint by users.

The top management and business systems department (BSD) actively encourage personnel to use PCs. This reflects an objective of relieving the AS/400s of some of their load as well as a commitment to develop a more effective organization which reaps the benefits of IS. In 1994, a LAN was established in the headquarters to connect standalone PCs. A project is under

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way to establish several LANs in the plants and branches and interconnect them through X25 communication lines.

Company D has also started a multimillion dollar project for new software and hardware systems to meet the requirements of the next five to eight years. MFG-PRO and SAP were examined to replace current production systems. These are both comprehensive software systems with numerous modules. The decision was made in favour of SAP and personnel training was started in April 1995. The decision process for selecting hardware started in May 1995 and three top-end Hewlett Packard Unix computers were bought.

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The parent company has an extensive global strategy for IS and it recommended several hardware and software systems during Company D's selection process. Company D's decision (SAP software on Hewlett Packard machines) reflects the global IS strategy of the parent company.

Contrary to many other local and multinational organizations in the country, the post of business systems manager in Company D is not filled by an individual with an IS background. Instead, this post is "visited" by line managers from other functions such as sales, finance, or marketing. Managers rotate generally once in two years and this post is seen as no different from the others. BSD staff are also rotated to other departments in the organization. From an IS point of view, the main reason for this is to avoid a "techie" department which provides little support to real business objectives. Although BSD is a fairly large department with a multimillion dollar budget, it has only six employees from Company D. The required technical expertise, support for system development and maintenance and even daily operation of the computers are outsourced to local companies and contractors.

Company D's EIS was initiated by the business systems manager in June 1994 as a low-profile project. He assigned an analyst programmer from one of the external computer companies to develop the initial prototypes. Another analyst programmer was assigned for extracting data from the AS/400s. The prototypes were developed in Visual Basic and were shown to the general manager and the executives. After a few amendments, the system became operational and users demanded more from the system. Since Visual Basic was not seen as an ideal tool for developing a system like the EIS, development of a new version was started in September 1994. Another analyst programmer from the same external company was assigned for this second phase of the project. Initial prototypes for the new version were developed in one month in Microsoft's Access and the system became operational in October 1994. The system enjoyed modest success and, encouraged by this, the manager has decided to examine vendor EIS software to increase deliverables to the executives. It is noteworthy that there was no demand from the executives to develop a system which would enable them to perform more detailed analyses in the topics they examined, they demanded horizontal rather than vertical expansion (in respect to topics covered) of the system. Thus, it could be argued that they are using the reporting rather than the analysis aspect of the EIS. Keeping this in mind, the manager is

currently in the process of selecting a front-end tool rather than a comprehensive multidimensional EIS package with a large middleware component.

Characteristics of EIS adoption in Turkey

EISs are not a common form of end-user computing (EUC) in Turkey and have been implemented only in a few pioneering organizations. The common characteristic of these implementations is their low-profile and low-key nature. This is understandable, because the organizations approach unfamiliar systems cautiously and the EIS initiators are also aware of such risks. With one exception (Company B), users are confined to top executives. It is therefore not possible to talk about the EIS being “everyone’s information system”. The systems are mainly used for reporting, rather than analysis purposes. Although this resembles the situation in the advanced EIS implementations, there is an important difference: in the advanced EIS implementations, the EIS is usually used as a front-end for reporting the analysis coming from the DSS (Frye, 1991, p. 111; O’Leary, 1990, p. 344). This is not true for the EIS implementations researched here, because there are almost no DSS tools available for such a purpose. The logic of “slide-show” screens is dominant in the implementations.

Organizational issues

EISs have the potential of altering the information flow in an organization. Thus, they may be threatening for people whose main task is to provide information to the upper levels. Consequently, they may be subject to organizational resistance. Although politics play an important role in Turkish organizations, no important resistance to the systems was encountered. Two reasons could explain this: first, the systems were perceived as too low-key to become a real threat for the organizational actors. Second, the executives usually provided the necessary support for the implementation initiatives.

The EIS initiators are usually the IS managers who are pursuing a higher profile in the organizations. EIS implementations in the country do not follow the familiar scenario in which the users demand far more than the IS departments can deliver. Rather, IS managers who are pursuing a higher profile for themselves and their discipline in the organizations attempt to create demand by giving “something already available” through the EIS. The reason seems to be that EUC (excluding personal productivity tools) is not very advanced in the organizations. The use of SMS in Company B is a good example. The system, the first example in the country, has several pre-designed screens requiring little user input. These are used by everyone who uses the system. Additionally, it has an *ad hoc* reporting facility which requires some degree of expertise. When the interviews were conducted, this facility was mastered only by the general manager who is a “power user”. The younger users were in the process of learning to use the facility effectively.

Since the EIS implementations are low-key projects, the EIS teams usually contain one or two IS personnel who spend part of their time on the project. It cannot be argued that the systems are well focused for clearly defined

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organizational goals. Although the global IT strategies of the parent organizations are explicit and well defined, this is not always true for the subsidiaries in Turkey. Their EISs make little contribution to strategic organizational objectives.

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Technical issues

The four organizations tended to overemphasize the technical aspects of the EIS at the cost of the managerial aspects, although this can be expected change in future.

The EIS was a good indicator of the robustness of the production systems in the organizations researched. Although all of them had problems with data inconsistencies, they were not severe enough to prevent the systems being developed further.

The systems developed were mainly EIS front-end tools. Except for Company B's SMS they did not contain any sophisticated middleware for advanced analysis capabilities.

Three of the four companies developed their EISs in the Windows environment which offers advanced data exchange capabilities. All of them use LANs which facilitate easy data exchange.

An iterative/evolutionary approach was evident in EIS development. However, rather than being a conscious choice, this approach is common in the country for most IS development efforts including some large projects. Nevertheless, there is a growing and opposite trend in Turkish organizations. For example, over the last few years new software houses have emerged specializing in system development methodologies. They either act as consultants in the development methodologies that they have developed, or alternatively they develop systems for the clients using their methodologies.

Most of the systems were developed with internal resources. This resembles the earlier phase of the EIS in the developed countries. One could expect that in future vendor software will become dominant in Turkey, too. Update frequency is ranging from daily to monthly. It is likely that the frequency will increase with increasing usage. The response time of the systems, a key concern with EUCs directed at high-level staff, was regarded as satisfactory. It was under three seconds in most of cases. Some of the systems researched enable users to access from outside, which is regarded as a very useful and popular facility, indicating a demand for teleworking and mobile computing.

Users' issues

Most of the EIS users have used computers before. However, their usage has been limited to personal productivity tools. Although an EIS is a quite different concept, familiarity with computers prevented them from having the older executive culture in which "typing is regarded as the secretary's job". Although most of them were not "power users", they perceived computer usage as a normal part of their jobs. To give an idea of the level of executive computing in

the four companies interviewed, almost all executives are notebook or desktop computer owners as of January 1996.

Information presented

The systems employed the classic EIS navigation method in which screens are accessed by successive menu steps.

All systems researched presented hard (numerical) and internal information. It could be argued that soft (textual) information will be sought by the users with increasing experience. It could also be expected that external information, which is used in some other IS applications of some of the organizations studied, will also be available in their EISs in future.

It is not possible to argue that the systems have been ideally designed or that they have been brilliantly successful by perfectly solving specific business problems. They made only modest contributions to some organizational goals.

Sales were the most common type of data presented. Some systems had also other types such as financial and inventory control. One could expect that in future computers will present a broader range of information to Turkish executives. For example some organizations sell online stock exchange and foreign currency data and decision makers are the primary consumers of this information. An EIS can easily present these data as well as analysing them for future trends.

Operational issues

The organizations researched tended to perceive the EIS just like any other IS application, i.e. they did not seem to be aware of the specifics. Hence, the problems and difficulties with the EIS were perceived to be no different from those of other systems. The only difference perceived was the specific nature of the user population. Although this unfamiliarity with EISs implies immaturity in IT, the competence of the development and support staff was not questioned in the organizations researched. Just the opposite, they were regarded as high-calibre professionals.

Security facilities were unsatisfactory. Although the systems contained sensitive information which the executives wanted to keep for themselves, most users could access it with their ordinary passwords. It seemed that the executives were not aware of the importance of the problem and the IS departments did not want to assume "another burden" of implementing tight security measures. An EIS developer in Company D commented sarcastically that they established security for the EIS simply by not informing non-users of its existence!

Costs and benefits

Contrary to practice with many advanced EIS applications, no formal study of critical success factors (CSF) or key performance indicators (KPI) was conducted in the implementations researched. This is partly because of the low-profile nature of the systems and partly owing to the accustomed system development

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practices in the country which usually incorporate unplanned and reactive behaviour. Although everybody is aware that this type of behaviour is not ideal for a highly analytical process like information systems development, it is not easy to develop alternatives since it is deeply rooted in the culture. For example, the business systems development people in Company D have made sincere attempts to overcome this problem in their implementation process for their German SAP production control software. They had developed a tight schedule of seven months and they guaranteed that the users will be able to use the system with live data by 1 March. Although the implementation process was quite successful, an unanticipated problem which occurred in the last few days, prevented the system from going live by 1 March. Instead, the users had to wait a few days more for their new system. Although they regarded this delay as unimportant compared with the benefits offered by the system, the morale of the implementation staff, which included the author, was affected adversely. They felt that they were not able to keep their promises on such an important project. Such an emotional behaviour pattern is common in the Turkish working environment and project managers have to consider it seriously when thinking about tight schedules and plans (see Kirlidog and Little, 1995).

While none of the EIS-implementing organizations performed any formal cost-benefit analysis, the systems were reported to be beneficial for the executives by enhancing their mental models of their organizations. In concrete terms, they enabled them to acquire a better understanding of their organizations.

The systems were seen as effective in creating a better communication environment. This was accomplished by conveying rapidly to its destination relevant information which could otherwise be subject to filtering or delay.

The system's contribution to an increased competitive advantage was usually indirect and insignificant. This could be expected, because the state still controls a large part of the economy and sometimes the real competition between large industrial groups is about getting the support of politicians and bureaucrats. Privatization, which is claimed to be a remedy to this problem, is also carried out with dubious practices.

The systems were usually updated in due time and the EIS teams were successful in avoiding any surprises. This resulted in more timely information for the users which is becoming increasingly important. However, the EIS had a modest effect on the personal productivity and efficiency of the users.

Motivation and rationale for implementation

Since the IS departments initiated the projects in most of the cases, essentially it was their motivation and rationale which were incorporated in the implementation decisions. As stated above, their main rationale seemed to be to have a higher profile in the organization as well as having direct access to the executives. However, understandably, they had to emphasize the organizational rather than the personal rationale for the implementation. For example, an interviewee hinted that the IT director of Company A, who initiated the system,

had the clear objective of easy and risk-free access to higher level executives as well as having a higher profile in the organization. In saying this, the interviewee was not criticizing the IT director; he seemed to perceive these motivations as perfectly normal in the organizational environment.

Since the organizations had myriad problems, it was not difficult for the EIS initiators to find one which could be solved by the EIS. Thus, solving an immediate business problem often became an official rationale for implementing the system. However, cost cutting and the trend for a flatter and leaner organization did not seem to be the direct motivations and rationale for the implementations. Like most buzzwords, the flatter and leaner organization concept is in the process of being imported to the country and an EIS can be invented as a vehicle to realize this goal at the cost of jobs.

An increasingly competitive and turbulent business environment, which is even harsher in Turkey, is always a strong motivation for implementing computerized information systems. This environment also provides persuasive arguments for EIS implementations.

Responsiveness to the market was usually an indirect motivation and rationale for the implementation. The EIS was not regarded as a vehicle for sending a signal to the organization by the executives about the importance of IT. They also did not have any intention to use it as an image-building vehicle.

A desire to access unfiltered information was a rationale for the implementation in only one of the four organizations researched.

EISs and other types of IS in Turkey

Table II presents Jayasuriya's (1993) framework for the stages of growth in the EUC. This enhancement of the similar work of Huff *et al.* (1988) is particularly applicable to the LDCs. The model incorporates the stages of isolation, organizational integration, technological integration and strategic integration. The last stage has been achieved mainly by countries such as Singapore which have attained an advanced level of IT development. In the framework, EISs, expert systems and group decision support systems are regarded as advanced-level technologies which are normally attained in the strategic integration stage.

Although incorporating some of the attributes from the strategic integration level such as the mainframe-micro links and distributed data processing, Turkey stands closer to the technological integration level in this framework. This is particularly true for the EIS, because EISs and executive computing are in their infancy in the country. Although the level of computerization can be regarded as fairly advanced compared with several other LDCs, there are only a handful of organizations which have implemented systems which could be identified as an EIS. Further, these systems are far away from the levels of sophistication which have been achieved by some other systems like MRPII and banking applications. Indeed, the information technologies used by the Turkish banks are regarded as being up to world standards. For example, most of the banks are connected to the global SWIFT system which enables electronic funds transfer (EFT) and almost all international and domestic banking transactions are performed

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Table II.
Some attributes of the
“technological integration”
and “strategic integration”
levels in Jayasuriya’s
framework for the stages
of growth in EUC

	Technological integration	Strategic integration
Structure	End-user support unit established	Links with EDP/MIS formalized
People	Lower-level managers use computers	End-user applications at top management
Technology	Networking and integrated database	Expert systems, EIS and GDSS
Position power for EUC	IS manager reports to top management	Chief of IS part of top management
Hardware	Networked micros in the centres	Mainframe-micro links
Software	4GLs used for developing applications for end users	Expert system software
Data	Data dictionary, data administration	Corporate data available to end users
Data transfer	Data transfer electronically	Distributed data processing
Managerial level of end users	Operational managers at state and districts	Top management

Source: Jayasuriya, 1993, pp. 154-7.

electronically. Several organizations have successfully implemented complicated MRPII packages which require a certain level of technical maturity as well as organizational sophistication. Keeping these in mind, an important question needs to be answered: what could be the reasons for the fact that executive computing (except personal productivity tools) and EISs are in their infancy compared with the other IS applications in the country? Four reasons seem to be responsible:

- (1) Most executives and IS managers are unaware of the existence of such systems. The IS managers who are somewhat familiar with EISs are usually aware of the risks associated with it.
- (2) The managerial practices in the country are not mature enough to be supported by computers. This is particularly true for the government offices where rationalization of the work practices is not the primary objectives and professional merit is not the only factor in managerial promotions.
- (3) Most organizations do not have the robust database systems required by an EIS.
- (4) Unlike the developed countries, there is no emphasize on the alignment of the business goals with an IT strategy. They are neither explicit nor clearly defined. EISs are thus overlooked owing to the lack of any IT strategy.

The risky nature of the EIS mentioned in the first argument deserves further elaboration in order to understand one of the reasons for its scarcity in the country. Risk taking and entrepreneurial types of behaviour are not common in the Turkish national culture. The turbulent economic and social environment plays a discouraging role for such lines of action. The risks are simply too much and sometimes too punishing for potential risk takers in their uncertain and unpredictable environments. This environment, which has important implications in shaping the national culture, compels people to avoid risks where possible. This is not specific to Turkey; it can be generalized for many of the LDCs. Hofstede (1980) reports that people are mainly unwilling to take risks and thus uncertainty avoidance behaviour is predominant in developing countries. In his study, which covers several subsidiaries of a large US multinational in 39 countries, uncertainty avoidance is one of the four dimensions of the national culture. Table III illustrates Hofstede's findings for some developing and developed nations.

Country	Uncertainty avoidance index
Turkey	85
Australia	51
Mexico	82
USA	46
Mean of 39 countries	64

Source: Hofstede, 1980, p. 165

Table III.
Comparison of
uncertainty avoidance
index for some
developing and
developed nations

Understandably, the desire for risk and uncertainty avoidance acts as a high entry barrier for EISs in developing countries. The author personally witnessed an event which demonstrates the importance of risk avoidance behaviour when explaining the EIS to a friend who is the IS manager in a medium-size local company. Although initially the IS manager was very interested in the concept, it was not long before he started asking questions about the potential risks. When the author talked about the risky nature of the system, the IS manager stated that a system which is regarded as risky in developed countries would involve even more risks in Turkey owing to factors like higher levels of organizational politics and the unknown nature of the system. As a consequence, he immediately lost interest in the concept of the EIS.

The managerial practices in the country also contribute to the scarcity of EIS applications. On average, Turkish managers have a paternalistic and authoritarian attitude (Dilber, 1981, p. 57), as in many other developing countries (Jaeger and Kanungo, 1990, p. 8). Consequently, information flow in the organizations is mainly from top to bottom in the form of directives and commands (Dilber, 1981, p. 88). On the other hand, an EIS is mainly a bottom-up

tool. As a consequence, the EIS initiators in the country have the difficult task of creating demand for a tool which is swimming against the tide.

Conclusions

This paper identifies Turkey as a developing country in the development queue with several other LDCs. It demonstrates many similarities with the other LDCs in economic indicators and in the maturity of IT usage. Hence, the findings of this research are of value to other comparable countries.

IS practitioners and researchers in developing countries have the difficult task of internalizing the procedures and products of alien cultures. Although there are innumerable problems in this process, there are also some advantages such as the existence of established standards and increasingly cheaper and more reliable technology. From the IS researchers' point of view, perhaps the most important presumption is that technology is not culturally neutral (see MacKenzie and Wajcman, 1994). LDC-based researchers have to establish research practices compliant with their own cultures. The aim of their research should be to foster robust information technologies in their home countries.

In many developing countries the computer is mainly used as a simple record machine to register organizational transactions. Although this is a necessary initial step that has to be covered, it is usually of little help with organizational effectiveness. Transactions are recorded by the computer; and stay there. However, the full power of information technologies can be attained only through the computer's advanced reporting and analysis capabilities. In other words, the input process must be followed by advanced output processes to nourish with knowledge people who need it most. DSS and EIS types of application must be assessed by the LDC researchers in this context. As the case studies in this dissertation demonstrate, such applications can be accomplished successfully with modest resources.

A longitudinal study of the four case studies described here could also give valuable hints about the evolution of EISs in Turkey and other developing countries. In the next five years, the EISs in these four organizations could take the following routes:

- They may spread horizontally and vertically, i.e. they can become real "everyone's information systems". Alternatively, their user numbers may remain the same or even decrease.
- They may be replaced by more sophisticated systems which cover a broader range of organizational issues. Such a case can be realized only if the organizations are convinced of their benefits. Alternatively, they may remain low profile systems which provide limited benefit to their users.
- Relatively advanced information technologies have been presented to the executives and managers in these four organizations. In other words, the "supply" side of the chain has been completed. The future of the EIS will be determined mainly by the "demand" from the users. Arguably, the

nature and intensity of that demand could also give hints about the managerial maturity of the organizations.

Like the CPG sector, the banking industry is also rich in data and involves fierce competition. Imitation of ISs is common in this industry and an initially successful EIS implementation is likely to be copied by other banks in the near future.

As stated earlier, the IS people who developed the EISs in the four case-study organizations did not seem to distinguish their systems from other IS applications. Despite this fact, they were regarded as competent people and none of the interviewees had any complaints about their obvious "techie" nature. Such a situation would probably be a problem in developed countries where IS people are expected to be less technical and more business oriented. A comprehensive analysis of the nature of IS people in developing countries and their attitude towards EIS applications could also be an interesting research topic.

With the diffusion of the EIS to other cultures, there is a growing interest in anglophone countries in the implications of cultural and cross-cultural issues for EIS applications (e.g. Leidner *et al.*, 1995; Watson *et al.*, 1995). It could be expected that this interest will increase in time by the increasing number of EIS implementations in non-anglophone countries.

Being a relatively advanced IS application, the EIS is in its infancy in Turkey. This is in contradiction to the fact that the country is fairly computerized compared with many other LDCs. The implications are clear: managerial practices in the country still have a long way to go to reap the benefits offered by information technologies. The case studies summarized in this paper suggest that this is mainly a process of cultural transformation rather than a matter of technical maturity.

References

- Armstrong, P. (1988), "Labour and monopoly capital", in Hyman, R. and Streeck, W. (Eds), *New Technology and Industrial Relations*, Basil Blackwell, New York, NY.
- Banerjee, U.K. (1981), "Control informatics – its role in developing countries", in *Informatics and Industrial Development – Proceedings of the International Conference on Policies for Information Processing for Developing Countries*, Tycooly International Publishing, Dublin.
- Bell, D. (1974), *The Coming of Post-Industrial Society*, Heinemann, London.
- Buckingham, R.A. and Land, F.F. (1987). "Education for ISE: what does it mean?", *Computer Bulletin*, June, pp. 33-5.
- Chepaitis, E.V. (1992), "Information systems in lesser developed countries: seminal questions in planning and control", in Palvia, S., Palvia, P. and Zigli, R. (Eds), *Global Issues of Information Technology Management*, Idea Group Publishing, Harrisburg, PA.
- Davis, G.B. (1992), "A model for adoption and diffusion of information systems in less developed countries", in Palvia, S., Palvia, P. and Zigli, P. (Eds), *Global Issues of Information Technology Management*, Idea Group Publishing, Harrisburg, PA.
- Dilber, M. (1981), *Türk Özel Kesim Endustrisinde Yönetiş Davranışları (Managerial Behaviour in the Turkish Private Sector)*, Bogazici Universitesi, İstanbul.
- Frye, C. (1991), "Three routes to EIS: mainframe, PC, pieces", *Software Magazine*, October, Vol. 11 No. 12, pp. 110-17.

- Hall, E.T. and Hall, M.R. (1990), *Understanding Cultural Differences*, Intercultural Press, Yarmouth, ME.
- Hofstede, G., (1980), *Culture's Consequences: International Differences in Work-related Values*, Sage Publications, London.
- Huff, S.L., Munro M.C. and Martin B.H. (1988), "Growth stages of end user computing", *Communications of the ACM*, Vol. 31 No.5, pp. 542-50.
- IIKBSCG (1992), "Turkiye'de bilisim sektorunun gelizebilmesi icin alinmasi gerekli onlemler" ("Measures required to foster the IT sector in Turkey"), *Bilisim*, September, pp. 38-46.
- Interpro (1993a), *Ilk 100 Bilgisayar Kullanicisi ve 1993-95 Yatirim Tahminleri Arastirmasi (100 Largest Computer Installations and 1993-95 Investment Estimations)*, Interpro Pazar Arastirmalari Merkezi, Istanbul.
- Interpro (1993b), "1992'de 30 bin adet ithal yazilim satildi" ("30,000 Units of Imported Software Sold in 1992"), *Bilisim*, December, p. 84.
- Jaeger, A.M. and Kanungo, R.N. (Eds) (1990), *Management in Developing Countries*, Routledge, London.
- Jayasuriya, R., (1993), "Stages of growth in end-user computing: applications in the health sector of developing countries in Asia-Pacific", *Journal of Information Technology*, Vol. 8, pp. 151-9.
- Kaplinsky R. (1994), *Easternization: The Spread of Japanese Management Techniques to Developing Countries*, Frank Cass, Ilford.
- Kazdagli, G. (1994), "Ulkemizdeki 3,681 ATM'nin degeri 147 milyon dolar (3,681 ATMs in Turkey are valued at US\$147 million)", *Bilisim*, February, pp. 18-20.
- Kirlidog, M. and Little, S. (1995), "A comparison of emotional behaviour in Turkish and Australian organizations", *Sixth Asian-Pacific Researchers in Organizational Studies (APROS) International Colloquium*, Cuernavaca, Mexico.
- Leidner, D.E., Carlsson, S. and Elam, J.J. (1995), "A cross-cultural study of executive information systems", *Proceedings of the 28th Annual Hawaii International Conference on System Sciences* Vol. III, pp. 91-100.
- Little, S.E. and Margetson, D.B. (1989), "A project-based approach to information systems design for undergraduates", *Australian Computer Journal*, Vol. 21 No. 2, August, pp. 130-38.
- MacKenzie, D. and Wajcman, J. (Eds) (1994), *The Social Shaping of Technology*, Open University Press, Milton Keynes, UK.
- Munasinghe, M. (Ed.) (1989), *Computers and Informatics in Developing Countries*, Butterworths, London.
- Nidumolu, S.R. and Goodman, S.E. (1993), "Computing in India: an Asian elephant learning to dance", *Communications of the ACM*, June, Vol. 36 No. 4, pp. 15-22.
- Odedra, M., Lawrie, M., Bennett, M. and Goodman, S. (1993), "Sub-Saharan Africa: a technological desert", *Communications of the ACM*, February, Vol. 36 No. 2, pp. 25-9.
- OECD, (1994), *OECD Economic Surveys: Turkey*, OECD Publications, Paris.
- O'Hara-Devereaux, M. and Johansen, R., (1994), *Globalwork: Bridging Distance, Culture and Time*, Jossey-Bass, San Francisco, CA.
- Ohmae, K., (1993), *The End of the Nation State: the Rise of the Regional Economies*, The Free Press, New York, NY.
- O'Leary, M. (1990), "Putting Hertz executives in the driver's seat", in Watson, H.J., Rainer, R.K. and Houdeshel, G. (Eds), *Executive Information Systems*, John Wiley & Sons, New York, NY.
- Onalan, A.U., (1994), "Internet", *Bilim ve Teknik*, May, pp. 8-12.
- Paker, Y. (1981), "Informatics and development: UNESCO's approach for the '80s", in Bennett, J.M. and Kalman, R. (Eds), *Computers in Developing Nations*, North-Holland, Amsterdam.

- Palvia, S., Palvia, P. and Zigli, R. (1992), "Global information technology environment: key MIS issues in advanced and less-developed nations", in Palvia, S, Palvia, P. and Zigli, R. (Eds), *Global Issues of Information Technology Management*, Idea Group Publishing, Harrisburg PA.
- Perelet, R. (1977), "Minicomputer systems to manage industries", in *Informatics and Industrial Development – Proceedings of the International Conference on Policies for Information Processing for Developing Countries*, UNIDO/IOD.91, Vienna, Tycooly International Publishing, Dublin.
- Porter, M.E. (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*, Free Press, New York, NY.
- Porter, M.E. (1990) *The Competitive Advantage of Nations*, Macmillan, London.
- Price, R., (1988), "Information, consultation and the control of new technology", in Hyman, R. and Streeck, W. (Eds), *New Technology and Industrial Relations*, Basil Blackwell, New York, NY.
- Sackman, H., (1981), "The information rich versus the information poor", in Bennett, J.M. and Kalman, R.E. (Eds), *Computers in Developing Nations*, North-Holland, Amsterdam.
- Sprague, R.G. and McNurlin, B.C. (1993), *Information Systems Management in Practice*, 3rd ed., Prentice-Hall, Englewood Cliffs, NJ.
- Sproull, L. and Kiesler S. (1991), *Connections: New Ways of Working in the Networked Organization*, MIT Press, Cambridge.
- Strang, M. and Redmond A. (Eds), (1991), *Turkey and the European Community: A Forum Europe Conference*, Forum Europe, Brussels.
- Ulurmak, G., (1993), "PC pazarini 486'lar kapladi" ("486s invade the PC market"), *Bilisim*, June, p. 94.
- Watson, H.J., Watson R.T., Singh S. and Holmes, D. (1995), "Development practices for executive information systems: findings of a field study", *Decision Support Systems*, Vol. 14, pp. 171-84.
- World Bank (1993), *Turkey: Informatics and Economic Modernization*, World Bank, Washington DC.
- Yavas, U., Luqmani, M. and Quraeshi, Z.A. (1992), "Facilitating the adoption of information technology in a developing country", *Information and Management*, Vol. 23, pp. 75-82.

Appendix: "template" for structured EIS issues

Organizational issues

- Resistance and organizational politics.
- Initiator of the EIS.
- Limits of what IS departments can deliver.
- The EIS team.
- Focus of EIS.
- Alignment of business goals and IT strategy.

Technical issues

- Existence of reliable transaction processing systems.
- Middleware.
- Exchanging information.
- Development methods.
- Response time.
- In-house or vendor software.
- Frequency of updating EIS database.
- Access from outside.

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Users' issues

- Computer literacy.
- Attitude of executives on computer use.
- Mode of use.

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Issues related to information presented

- Information content.
- EIS information and organizational goals.
- CSF and KPI.
- Speed of change of information.
- Structure of data presented.
- Type of data presented.

Operational issues

- Difficulties inherent in EIS.
- Security.

Costs and benefits

- Enhanced mental models.
- Improved communications.
- Better focused organizational attention.
- Increased competitive advantage.
- Increased personal productivity.
- More timely information.
- Standardization and consistency of terminology.

Motivation and rationale for implementation

- To solve an immediate business problem.
- Cost reduction.
- Trend for flatter, leaner organizations.
- Increasingly competitive and turbulent environment.
- Responsiveness to the market.
- A signal to the organization.
- Image building.
- Desire to get unfiltered information.